

HB 1321

.H58

Copy 2

Hoffmann, F.L.

The Chances of Death and the Ministry of Health

By

Frederick L. Hoffman, LL. D.

Statistician

The Prudential Insurance Company
of America

0 2 20
1 2
10 2
20 2

Address delivered before the Divinity School, Yale University,
New Haven, Conn., March 30, 1914

Copy 2

HB1321
H58
copy 2

By transfer

APR 20 1915

THE CHANCES OF DEATH AND THE MINISTRY OF HEALTH

The Functions of Modern Medicine

The problems of death and the duration of life have at all times been the subject of much profound speculation and theoretical as well as practical analysis. The average as well as the maximum attainable duration of human life must needs be a matter of serious concern to the individual and the state. The mortality experience of mankind in the mass reflects, with admirable accuracy, the attained degree of civilization as exemplified in the human control of the death rate; or, in other words, the prevention and successful elimination of diseases due to unfavorable external and controllable conditions affecting the duration of life. The day has passed forever when the average duration of life was complacently accepted as preordained or a matter of pure chance. In place of a fatalistic conception of death, a new doctrine of social and individual control of the death rate prevails, which accounts for the material improvement in health and longevity, which, by trustworthy records, is shown to have taken place throughout practically the entire civilized world within a comparatively brief period of time. This marvelous change may properly be considered one of the wonders of modern science and a human achievement transcending, in its far-reaching practical importance and enormous benefit to millions of mankind, all of the other great inventions combined. The modern control of the human death rate is due chiefly to the results of systematic scientific research and, to an increasing degree, of individual and social conformity to the teachings of natural laws and facts disclosed by the discoveries of preventive medicine. The domain of medicine is no longer considered exclusively the province of the physician, whose functions are limited to its practice as a healing art. Modern conceptions of public health and sanitary science have enormously broadened the field of medicine in general and brought the teachings of its principles within the understanding of the mass of the people of ordinary intelligence. We are apt to think contemptuously of the practices of the Medicine Man of our native Indians, but in very truth the gulf which separates primitive medicine from modern surgery is not as wide as the gulf which separates the fundamental conceptions of preventive medicine from those of medicine limited in its functions to a healing art. The modern doctrine that diseases on a large scale can be prevented and that some can be entirely eliminated

is as new to the world as the marvels of wireless telegraphy or practical aviation. The prayer of the Christian Church, "From plague, pestilence, and famine, good Lord, deliver us," is, in modern life, translated into the social and personal duty of effective conservation and public sanitary control. Epidemics, which in the past were often responsible for an enormous loss of human life, are no longer a constant menace to human happiness and a hindrance to the attainment of normal old age on the part of the many who now in health and vigor reach the Biblical period of threescore years and ten. Vast areas of the world are still subject to the ravages of cholera, plague and fevers, but gradually the area of effective sanitary administration is being enlarged, and, in civilized countries at least, the general death rate has been declining, until it has now reached the lowest point in the recorded history of mankind. Further improvements in health and sanitation are within the range of human achievement, and there is the strongest possible evidence to warrant the hope that within another generation most of the so-called preventable diseases will be entirely and effectively subject to human control. The relation of the death rate to history is not a fanciful suggestion, for there is increasing evidence, as the records of the past are studied, to warrant the conclusion that the fate and fortunes of mankind have been more often determined by the health and physical vigor of the inhabitants of great nations than by the wisdom or the lack of wisdom of kings and queens whose names are enshrined forever in the annals of time.

The mystery and the terror of death have at all times aroused the human imagination to fanciful conceptions, to elaborate funereal offerings and to an allegorical portrayal of life's slender chances, as best shown in the picturesque literature of the Dance of Death. Hans Holbein, the painter, ranks foremost in the effort to visualize the images and aspects of death in the lives of the rich and the poor, the powerful and the humble, the good and the bad, the old, the middle-aged and the young. Dagley, in 1826, portrayed death's doings by means of numerous original compositions in prose and verse, commencing with an allegory of the bubbles of life broken by Death, and including some exceedingly interesting observations on life assurance and the philosophical observation, justified by experience, "That man can not be a very worthless member of the community, whose natural affection induces him to deny himself all or many of the luxuries of life, and in some cases even to abridge what the self-indulgent consider its absolute necessities, in order that, when he is cold in the grave, his wife, or his children, may be placed in circumstances of ease and independence. Go, and do thou likewise."

On the cemetery walls of St. John's Church at Basle a whole series of paintings illustrate the chances of death and the casualties of life from

the minister to the maiden, and from the wise man to the fool. The lesson taught by all of these interesting and instructive observations in their modern interpretation is the error of the past that the duration of life is conditioned by pure chance, and therefore beyond the control of man, and the resulting confusion of thought that though death is ultimately inevitable it is not generally unavoidable during a large portion of the allotted span of life.

In the "Vision of Mirza," Addison has immortalized his conception of the bridge of life in the words:

"I see a bridge," said I, "standing in the midst of the time." "The bridge thou seest," said he, "is Human Life; consider it attentively But tell me farther what thou discoverest on it." "I see multitudes of people passing over it," said I, "and a black cloud hanging on each end of it." As I looked more attentively, I saw several of the passengers dropping through the bridge into the great tide that flowed underneath it.

Karl Pearson, in this connection, though himself the foremost exponent of scientific research into the underlying factors of the chances of living and dying, observes that "The shadow of death, more strongly even than blood or nation, maketh mankind akin; it arouses sympathy and understanding, which surmount all the barriers of caste and station. The old Dances of Death supplied what fails so much in our modern life—an artistic representation appealing to all classes of at least one experience common to the whole of humanity."*

The scientific study of death is called thanatology, and, as said by the late Roswell Park, who coined the term, it is a much neglected subject. The best modern treatise on the subject is by Charles S. Minot, published under the title "The Problem of Age, Growth and Death," in the Science Series of 1908. This is a study of cytomorphosis, or the conception that death is a function of age in its relation to the cellular changes of the body. Just as no one has as yet succeeded in providing an entirely satisfactory definition of life, so also there is no concise description or brief generalization of the terms "death" and "disease." We are not able to give an answer to the question as to how life originated, and it is quite probable that the riddles of life and death will prove continuous with the duration of human existence on the earth.

The conception of death in modern life as a matter of pure chance has no doubt lost much of its earlier significance. The abject terror and the blind acquiescence common to periods of history when epidemic diseases destroyed vast numbers of lives within an incredibly short period of time have given way to an increasing faith and certainty in the

*NOTE—Among the more important contributions to the literature of the Dance of Death are: the Volume of Fac-simile Reprints of the Holbein Society, published London, 1869; *Death's Doings*, with 24 plates, by R. Dagley, published London, 1826; the *Dance of Death* by Holbein, published London, 1887; and the *English Dance of Death*, with 74 colored plates, by T. Rowlandson, published in the Illustrated Library of Plain and Colored Books, London, 1903.

prolongation of human existence and the normal attainment of at least the Scriptural period of threescore years and ten. It is quite difficult for the modern mind to visualize effectively the terrible experiences passed through by the people of this country in the last years of the eighteenth century, when yellow fever prevailed as far north as Boston, New York and Philadelphia, or even in the middle of the nineteenth century, when the same dread disease devastated time and again the larger cities of the lower South. Cholera prevailed to the extent of an alarming epidemic in the City of New York in 1849, and as late as 1905 yellow fever paralyzed the commerce of the South and brought sorrow and grief to the homes of many, from the throne of an archbishop to the hovel of the poor. It would serve no purpose to review on this occasion the sanitary history of the nation or to comment on the frightful waste of human life incident to the epidemics which in the past have devastated this land, hindered its material progress and brought sorrow and affliction to the homes of helpless millions. Nor would it serve much of a purpose to recall the history of the Black Death of the fourteenth century, which, in all probability, was the most deadly pestilence in the history of mankind. Rather than, in the words of Hecker, the historian of the Black Death, "That Omnipotence, which has called the world with all its living creatures into one animated being, especially reveals Himself in the desolation of great pestilences," is it true to-day that such lamentable and destructive occurrences reveal human ignorance and human indifference, in contrast to realized intelligence and sanitary control. Rather than it being true, again in the words of Hecker, that "Nature is not satisfied with the ordinary alterations of life and death," and that pestilence and plague are revolutions "performed in vast cycles, which the spirit of man, limited, as it is, to a narrow circle of perception, is unable to explore," is the modern and incontrovertible fact that these recurrences, so characteristic of the past history of mankind, can be and are made impossible by a more rational mode of life, considered individually, and in the aggregate subject to intelligent acquiescence in the established truth of sanitary science and sanitary control.

We are no longer seriously concerned with the possible risk of nationwide epidemics, which are effectively guarded against by a national health service protecting the people against the introduction of plague and pestilence from abroad. Modern preventive medicine concerns itself chiefly with the spread of less destructive transmissible diseases, which still in the aggregate, however, cause a lamentable and largely needless loss of human life. The hygiene of transmissible diseases, their causation, modes of dissemination and methods of prevention, constitutes a branch of science than which none has yielded results of greater benefit to man-

kind. Either the causation of such diseases or the mode of their spread from one person to another is now reasonably well understood, and the factors of transmission are controlled to a degree which falls little short of the miraculous. Most of the so-called preventable diseases are diminishing in frequency in civilized countries, chiefly smallpox, typhoid fever, tuberculosis, diphtheria, measles, scarlet fever, whooping cough, malarial fever, etc. Some of these diseases are controlled by vaccination or protective inoculation, as best illustrated in the marvelous results of typhoid fever prophylaxis in the United States army, by means of which the rate of frequency occurrence has been brought practically to a negligible quantity. Many of these diseases, however, are so widely diffused, and they are so complex in their relation to the human environment and the habits and customs of the human individual, that many years will pass before the death rate will be strictly normal, and one, on being born, will have a fair chance of attaining the maximum duration of life. But the future outlook for life extension is most encouraging, and there can be no question of doubt but that during the next generation a still further material reduction in the general death rate will be achieved.

The Human Control of the Death Rate

The discovery of a great truth serves no real purpose unless the new knowledge is realized in conduct and used in the solution of the problems of society. The realization of the ideal in health administration requires the intelligent, sympathetic and effective cooperation of all the various interests affected. The burden of responsibility for a high death rate falls, not on the medical profession, but largely upon the public itself, since the problems of sanitary control are largely and fundamentally a matter of government supervision and concern. The responsibility for life waste is one of inefficient citizenship, on the one hand, and of inefficient leadership and direction, on the other. The duty of direction and control is individual as well as social, and concerns the ministry of the spirit as much as it does the ministry of the body. The whole problem of life conservation is condensed in the principle of Christian ethics, as laid down in Ecclesiastes vii:17, "Why shouldest thou die before thy time?" The answer is no longer a riddle of the universe, but a palpable truth obvious even to the ignorant in the light of modern knowledge. But the truth has come like a startling revelation to intelligent mankind, that pestilence, and even the common diseases of human life, are largely because of gross neglect, gross indifference, filth, ignorance and unwarrantable delay in heeding the earliest symptoms of maladjustment in the human economy or the need of repair in the human machine. Problems of life and health are, therefore, matters of most serious con-

cern to the clergy as well as to the physician, to the teacher as well as to the sanitary officer, and, in fact, in no relation of life is the Biblical doctrine that we are all our brother's keeper more beautifully illustrated than in the chances of death and the ministry of health. Rigid conformity to the truth of the causation of tuberculosis, of the spread of diphtheria by personal infection, of the contraction of smallpox by neglect of vaccination, of deaths from yellow fever because of contempt for the *stegomyia* mosquito, all prove the infinite possibilities of realizing life's larger purposes by the intelligent prevention of its needless waste. Instruction of mothers in the hygiene of infancy will effectively aid in solving the question as to whether the child will live and grow in strength of body and mind, just as rigid conformity to established principles of safety will protect the lives of passengers on land and sea. It is largely a question, first, of knowledge, then, of understanding, and, finally, of unswerving fidelity to the principles of truth as applicable to human conduct for the purposes of human betterment.

The Increase in the Duration of Life

The present annual death rate of the United States is only 13.9 per 1,000, against a rate of 19.8 in 1880. The saving in years of life in consequence of a declining death rate is so enormous for a vast country like ours that the true meaning of statistical calculations can hardly be made intelligent to the average mind. Sooner or later every one must die, but the question is one of how long, on the average, each life can be made to last, when a gulf greater than the Atlantic or the Pacific separates the people who in one section live to an average age of 45 and in another to 60. Life tables illustrate with scientific precision God's law as applied to the tenure of man's existence on earth, but what is called the law of mortality is rather a symbolic expression of the law which governs all collective phenomena in the order of logical sequence, without which human existence, and in fact all existence, would be chaos. A study of mortality problems reveals more accurately than many another branch of science the marvels of life in the aggregate as conditioned by the more or less perfect coordination of the units, whether merely physically considered or also in the broader sense of the psychological, moral and spiritual. The duration of life is determined by an almost infinite number of variants and even the wisest fail in the attempt to comprehend the whole. The diseases which afflict mankind are numerous, but most of the waste of life is due to a comparatively small number of causes, chiefly, in our own country, tuberculosis of the lungs, accounting for 9.4 per cent. of the whole; organic diseases of the heart, accounting for 10.3 per cent.; acute nephritis and Bright's disease, accounting for 7.4 per cent.;

pneumonia, accounting for 6.1 per cent.; and cancer, accounting for 5.6 per cent. These six causes alone are responsible for 38.8 per cent. of the entire mortality. Other diseases, now largely under control but intrinsically as serious a menace to community life as any of those mentioned, are typhoid fever, smallpox, measles, scarlet fever, whooping cough, diphtheria, etc. The typhoid death rate, which is typical of sanitary progress or neglect, has declined in American cities from an average of 51 per 100,000 of population during the decade ending with 1892 to 25, or just about one-half, during the decade ending with 1912; but our typhoid fever rate is still excessive and no cause of death perhaps illustrates better the lamentable amount of still existing municipal neglect. Tuberculosis, the foe of mankind for ages, the disease par excellence, considered a visitation of God, has, during the last generation, been brought within the range of human control, with a fair prospect that within a measurable period of time its ravages will be reduced still more than has been the case in the recent past. The tuberculosis death rate of American cities during the decade ending with 1882 was 318 per 100,000 of population, but the rate during the last decade was only 182. Within more recent years the mortality from smallpox has been reduced from an average of 3.4 during the five years ending with 1905 to a rate of only 0.3, or about one-tenth of the earlier rate, during the year 1912. The mortality from the dread diseases of infancy, diphtheria and croup, has been reduced from an average of 29.6 during the five years ending with 1905 to 18.2 during the year 1912. We have no deaths from Asiatic cholera, nor from plague, except at quarantine stations subject to Federal control; either they are isolated or their introduction into this country is practically made impossible by means of a national health administration which challenges the admiration of the world. Yellow fever is no longer the foe of southern states, and we have had practically no deaths from the disease since 1905. Of leprosy we have a few cases annually, but excepting the well known leper settlements in Louisiana, there is slight danger to the country of a recrudescence of this perhaps most awful affliction of mankind.

New Problems of Public Health

But with the passing or control of the diseases which have become common knowledge, new ailments and afflictions cause new problems of serious importance, because the conditions of spread are either entirely unknown or but imperfectly understood. Influenza is one of these diseases, which, within recent years, appeared for the first time as a national scourge in 1891, causing directly or indirectly an enormous loss of life, and the disease has since prevailed to a more or less extent, either

as an immediate cause of death by itself or as a cause or condition complicating other diseases. Pellagra may be mentioned in this connection as one of the new diseases in this country, the nature and treatment of which are as yet rather doubtful, but the combined efforts of the Federal and State governments, aside from the aroused interest of the medical profession, are at work to determine the methods of control. The word "control," perhaps better than the word "prevention," gives expression to the human effort in the struggle of mankind against disease and early death. No affliction of mankind to-day demands more serious consideration as a world menace than cancer, which has been increasing in practically every civilized country, and in the United States approximately at the rate of 25 per cent. during the last decade. Cancer, or malignant disease, is one of the most mysterious afflictions, and it is doubtful whether it will ever be traced to a single cause; it is more likely that it has its origin in a combination of causes and conditioning circumstances largely beyond the penetrating intelligence aided by the most powerful instruments of research. The present solution of the cancer problem is largely one of early diagnosis and the earliest possible surgical treatment, just as in fire-fighting the problem of conflagration prevention is one of efficient apparatus, almost instantaneous notification and prompt response to established needs.

Murder and Self-Murder

The problems of life, disease and death are endless. The duty of applied intelligence in dealing with questions of preventable life loss and preventable disease is now so obvious on the part of every citizen, and most of all on the part of the leaders of community life in matters material, moral, intellectual or spiritual, that it seems hardly necessary to refer to the profoundly sorrowful phase of human existence which leads to murder or self-murder, to insanity and degeneracy, or the deliberate impairment, by wrongful conduct, of the physical and mental faculties, with resulting pathological consequences and early death, or decrepit old age. The suicide rate of American cities has increased from an average of not quite 13 per 100,000 of population during the decade ending with 1892 to almost 20 during the decade ending with 1912. More persons die from murder and self-murder in this country every year than from either typhoid fever or diphtheria and croup. The annual loss of life on account of suicide in the United States may be conservatively placed at 15,000, and the average age of these unfortunates is approximately twenty years less than that in deaths from cancer. The subject of suicide has at all times attracted the attention of moralists and of spiritual leaders,

but considering the awfulness of the crime of self-murder against God and man, it is a reflection upon our intelligence, our morality and our conceptions of religious duty that so little should be heard in protest against this perhaps the most sad and sorrowful phase of human life. The defence of suicide among the Stoics never gained ground among civilized peoples, but there has grown up a toleration and indifference, than which there is hardly anything more deplorable in our present-day period of what we are pleased to speak of as civilization. It has very beautifully been observed in this connection by a writer on self-murder, over two hundred years ago, that, "Whatever the end of human life is, what disputes soever there may be concerning it; it is not the destroying it; since nothing can have being given to it only in order to be not being." There is no more fitting subject for religious discourse than the sanctity of human life, the inviolability of the human person, the duty of facing life's problems with courage and the ministry of suffering and sorrow as a means towards a more perfect spiritual attainment. There is nothing more deplorable in America than the contempt for life, as made evident by the waste of 15,000 lives through self-murder, and, in addition thereto, more than 6,000 lives ended each year by the murderous actions of others. The phenomena of murder and self-murder emphasize the practical value of a thorough understanding on the part at least of all those who are the responsible leaders in morality and religion of the elementary principles of law in the civil sense of the term, of the disorders of conduct biologically considered, of unsoundness of mind and the border-land of insanity.

Moral Significance of Life Extension

In other words, the conservation of human life and health, or, as said by Prof. Irving Fisher, the problem of life extension, is not only of economic, but also of great moral significance. The perfection of human character is, partly at least, conditioned by the maximum attainable duration of life, and old age is as essential to human development, moral and spiritual, as is the secular and religious education of youth.

Economic Aspects of Disease

Prolonged sickness, considered from this point of view, is frequently the cause of human failure, and premature death often terminates needlessly a most promising life. Sickness from preventable diseases is largely the result of social or individual indifference and neglect, but throughout the civilized world the importance of an effective sanitary administration is being recognized and the principles of sanitary science are being locally applied, with increasing evidence of beneficial results.

Required Cooperation for Social Control

The cooperation of the church has for some years been successfully enlisted in the nation-wide effort in behalf of the ministry of health. It has become the custom on the part of the churches to set aside at least one or two Sundays a year for emphasizing the importance of some great public health question, particularly, on the one hand, the need of adequate support for hospitals and other institutions of aid and relief and, on the other, the urgency of financial and personal cooperation in the fight against tuberculosis. It would not seem to be going too far, therefore, to suggest that this principle of active cooperation should be extended and made to include a more frequent, though perhaps but incidental, discourse on other lamentable phases of human life, particularly, as previously said, the sorrowful and wholly irreligious indifference to the sanctity of human life, as evidenced in the increasing tendency towards murder and self-murder.

Problems of Motherhood and Infant Mortality

This view can be carried further and made also to apply to the unborn generations, or the sanctity of marriage as an institution primarily established for the preservation of the family and the continuity of the species. It can no longer be questioned that a vast amount of wrongful conduct underlies the persistent and considerable decline in the birth rate, and it can also not be questioned that a considerable portion of this decline is but life destruction, or murder under another name. Ignorance, however, is the cause of far more waste of child life than deliberate crime, and the still enormous mortality of infants forcibly suggests the necessity for radical changes in the education of young men and women preparatory to marriage and parenthood. Out of every 1,000 persons born, approximately 125 die during the first year of life, largely because of the gross and inexcusable ignorance of mothers whose training in the essentials of motherhood was unhappily neglected. But much of this loss of life is the result of sanitary inefficiency, of a polluted milk supply, on the one hand, and not infrequently of medical incompetence, on the other.

The Ministry of the Visiting Nurse

One of the most efficient aids in the campaign against infant mortality is the Visiting Nurse, assisting the young mother in the proper care of the child and providing the required skilful assistance at a period than which there is none other so trying in a woman's life. The visiting-nurse movement is entitled to the most hearty moral and financial support, for the results of an efficient public nursing service

benefit the children as well as the aged and those suffering from slight ailments as well as those suffering from serious afflictions.

Problems of Child Care

No subject appeals more powerfully to the sympathies of mankind of every degree than the physical sufferings of little children born with permanent defects in body or mind, and for all the years of their existence more or less a burden to society. No institution serves a more humane purpose than the orthopedic hospital, where the afflictions of the congenitally deformed, by means of skilful surgery, are reduced to a minimum of physical suffering and physical incompetence; where, in fact, the lame are frequently made to walk, just as in the corresponding institutions for the blind, the deaf and the dumb, the defects of nature are partly made good by the skill of man. The institutional phase of modern life is one of increasing importance, for the limitations of the home frequently preclude adequate treatment and care under the best possible conditions. The natural reluctance of parents to part with their children or of families to submit to the seclusion of a much beloved member in an institution for the treatment or cure of some mental or physical defect requires the strongest moral and spiritual support from those who are in the best position to give advice and lend a hand. In all such cases a reasonably thorough understanding of the fundamental facts of human life, the chances of death, the rate of disease frequency, the possibilities of cure, all combine to further the higher purposes of society and bring about gradually, in however small a degree, the much required improvement in the conditions under which we live.

Alcoholism and Habit-Forming Drugs

Perhaps no problem of modern life is more serious in its moral and economic significance than alcoholism and the use of habit-forming drugs. If there is any one lesson taught by modern research into the biological laws which govern age, growth and death, it is that the human organism can not be abused or misused without the risk of most serious consequences and the practical certainty of physical impairment and premature death. The evidence is entirely conclusive that over-indulgence in alcoholic drinks is a fruitful cause of disease and moral depravity, while habit-forming drugs, including the misuse of tobacco, often and needlessly change a hopeful career into a hopeless human wreck. The most salutary influence is exercised by those who, by their own example, emphasize the value of right living, but this conclusion applies not only to moderation in the use of intoxicating drink, and much of what goes with it, but also to personal abuse or lack of

restraint of every other kind, especially the pernicious habit of over-eating, than which there is probably no more fruitful cause of bodily misery and premature physical decrepitude. It has been conclusively shown that those who are overweight live shorter lives and are more liable to diseases—possibly including one of the worst of human afflictions, that is, cancer—than do those who live abstemious lives, are careful in their diet and exercise restraint. The latter not only live longer, but, in the sum total of their years, enjoy a larger share of wellbeing than those who live contrarily to the obvious laws which govern the duration of the span of life allotted to us on earth.

Healing Power of Faith and Prayer

The problem of life and death is not only concerned with the things that are real but also with the innumerable imaginary and often abnormal fears, pains and diseased conditions of the body and mind resulting from the subtle but well established interrelation of the two. Of recent years new principles of therapeutics have been recognized, which range all the way from hypnotism to Christian Science. No one can question that there is therapeutic power in genuine faith as well as in fervent prayer. There is much unsoundness of mind and body due to other than physical causes, largely imaginary, no doubt, but just as real, and possibly more so, as the physical afflictions, which affect the body alone. From the uttermost depths of mental depression or melancholia to the uttermost heights of mental exaltation or mania, the human soul suffers infinitely more than the human body, and the agencies of relief must naturally be spiritual rather than physical. There is, therefore, a large field of usefulness in the ministry of health, which includes the ministry of the spirit, or of the mind diseased or in distress and in need of spiritual healing, as much as, or more than, it is in need of the aid of medicine as a healing art. This function of the Church is fortunately being recognized to an increasing extent, and while there no doubt have been much grotesque misuse of the opportunity and much downright charlatanism in the name of the holiest in Christian faith, there can be no doubt of the efficacy of spiritual healing in the furtherance of the larger cause of promoting the gospel of a healthy spirit in a healthy body.

The Function of Old Age

Every agency or effort making for health improvement necessarily makes for a prolongation of life. Such prolongation of life is of variable value, according to the age period affected, and while humanely most obvious in infancy and early youth, it is economically most useful during the productive period of life, and spiritually in the later years, when the

approach of natural death makes contemplation upon the problems of immortality, and possibly bodily survival after death, an imperative duty, the discharge of which can no longer be relegated to a future which, with certainty, we know is not to be. The utilization of old age, whether economic, social or spiritual, is one of the most neglected phases of modern life. The neglect has its origin in the fact that in past generations relatively so small a proportion born attained to real old age that, as a practical question, the matter received only academic consideration. With the lowering of the death rate and the increasing average duration and the necessarily larger proportion of persons living into the third generation, this problem of old age and its proper utilization is, from many points of view, one of the most important of the time. The question need not be discussed here further, but it is sufficient to have pointed out its practical importance to the Church as well as to the State.

The Problem Restated

The present population of the United States is not far from 100,000,000. The number of persons of both sexes, ages 70 and over, in 1910 was 2,270,021. According to the latest English life tables, out of every million born 277,351, or 27.7 per cent., may normally expect to reach the age of threescore and ten. In the United States the annual number of births is about 2,500,000, and the annual number of deaths is about 1,350,000. Of those who died during 1912, approximately 236,500, or 17.6 per cent., had lived less than one year, and 329,400, or 24.4 per cent., had lived less than five years.

The principal causes of death, in the order of their numerical importance and the approximate annual mortality therefrom are as follows: first, tuberculosis, which affects every period of life and causes in the aggregate about 154,000 deaths; second, heart diseases, also affecting every period of life, but chiefly ages over 40, causing a mortality of about 150,000; third, nervous diseases, which account for about 138,000 deaths; fourth, pneumonia (all forms), about 132,000; fifth, intestinal diseases, about 123,000; and, sixth, genito-urinary diseases, about 111,000. Following these six, in the order of importance, are accidents, causing about 182,000 deaths; and tumors, malignant and benign, about 75,000. These eight groups of causes combined account for about 72 per cent. of the aggregate mortality of the United States, which, as previously stated, is approximately 1,350,000 per annum. Other important causes are typhoid fever, the mortality from which is about 20,000 per annum; suicides, numbering approximately 16,000; deaths from parturition, about 15,000; and homicides, of which there are from six to seven thousand.

This may be considered the normal mortality of a civilized coun-

try not subject to exceptional or uncontrollable mortality conditions, such, for illustration, as continue to affect a great country like India even at the present time. The death rate of the registration area of the United States during 1912 was only 13.9 per 1,000, against a death rate of 32 for British India. Of the 7,500,000 deaths, in round numbers, during the year 1911, 354,000 were caused by cholera, 58,000 by smallpox, 733,000 by plague, and 4,200,000 by fevers. Most of these causes are no longer an affliction of modern civilized countries, and they are fortunately brought slowly under control in the Indian Empire, where the death rate has gradually been reduced from extraordinary proportions to a rate not much above the normal for the large cities of this country fifty years ago. The best illustration of India's marvelous sanitary progress is to be found in the reduction of the death rate of the European army during recent years. Military discipline and conformity to sanitary rules and regulations, no doubt, largely account for this reduction, which has been of immeasurable benefit, not only to the European but also to the native population.

Public Health and Christian Ethics

The principles of longevity are better understood to-day than at any time in the past. The duty of rigorous conformity on the part of the individual to the teachings of public and personal hygiene is no longer debatable. The facts and conclusions here advanced emphasize the great practical importance of a thorough and general understanding of the forces and conditions which make for human betterment through the ministry of health, conceived as a profound social duty, a personal obligation and a spiritual necessity, and as such indispensable for the furtherance and the ultimate attainment of the highest ideals of Christian citizenship.

Table I

Deaths from All Causes, U. S. Registration Area, 1900-1912

| Year | Population | Deaths | Rate per 1,000 of Population |
|-----------|------------|---------|---------------------------------|
| 1900..... | 30,765,618 | 539,939 | 17.6 |
| 1901..... | 31,370,952 | 518,207 | 16.5 |
| 1902..... | 32,029,815 | 508,640 | 15.9 |
| 1903..... | 32,701,083 | 524,415 | 16.0 |
| 1904..... | 33,345,163 | 551,354 | 16.5 |
| 1905..... | 34,052,201 | 545,533 | 16.0 |
| 1906..... | 41,983,419 | 658,105 | 15.7 |
| 1907..... | 43,016,990 | 687,034 | 16.0 |
| 1908..... | 46,789,913 | 691,574 | 14.8 |
| 1909..... | 50,870,518 | 732,538 | 14.4 |
| 1910..... | 53,843,896 | 805,412 | 15.0 |
| 1911..... | 59,275,977 | 839,284 | 14.2 |
| 1912..... | 60,427,133 | 838,251 | 13.9 |

Table II

Principal Causes of Death in the United States

| | Registration Area 1903-1912 | | Estimate for Continental United States During 1913 Number |
|-------------------------------|--------------------------------|----------------------------------|---|
| | Number | Rate per 10,000 Population | |
| Tuberculosis..... | 431,118 | 15.9 | 153,818 |
| Heart Diseases..... | 421,580 | 15.5 | 150,374 |
| Pneumonia (all forms)..... | 369,966 | 13.6 | 131,988 |
| Intestinal Diseases..... | 345,186 | 12.7 | 123,086 |
| Nephritis..... | 265,665 | 9.8 | 94,782 |
| Accidents..... | 230,679 | 8.5 | 82,348 |
| Cancer..... | 202,621 | 7.5 | 72,284 |
| Apoplexy..... | 198,657 | 7.3 | 70,832 |
| Liver Diseases..... | 61,694 | 2.3 | 22,063 |
| Bronchitis..... | 60,068 | 2.2 | 21,385 |
| Arterial Diseases..... | 59,036 | 2.2 | 21,056 |
| Typhoid Fever..... | 57,208 | 2.1 | 20,417 |
| Diphtheria and Croup..... | 54,118 | 2.0 | 19,304 |
| Stomach Diseases..... | 52,163 | 1.9 | 18,579 |
| Suicides..... | 44,602 | 1.6 | 15,908 |
| Parturition..... | 42,081 | 1.6 | 15,008 |
| Diabetes..... | 39,188 | 1.4 | 13,934 |
| Insanity..... | 24,010 | 0.9 | 8,563 |
| Diseases of Generative Organs | 17,588 | 0.6 | 6,271 |
| Homicides..... | 16,908 | 0.6 | 6,028 |
| All Other Causes..... | 912,923 | 33.9 | 277,014 |
| All Causes..... | 3,907,059 | 144.1 | 1,345,042 |

Table III

Death Rate* per 1000 Population, 1911, for the Registration States of 1900

| | Ages | Both Sexes | Males | Females |
|------------------------|------|------------|-------|---------|
| All ages: | | | | |
| Crude rate..... | | 14.9 | 15.8 | 14.0 |
| Corrected rate†..... | | 14.6 | 15.3 | 13.9 |
| Under 1 year..... | | 125.5 | 138.6 | 112.1 |
| 1-4 years..... | | 12.8 | 13.3 | 12.2 |
| 5-9 years..... | | 3.2 | 3.4 | 3.1 |
| 10-14 years..... | | 2.2 | 2.4 | 2.1 |
| 15-19 years..... | | 3.5 | 3.7 | 3.3 |
| 20-24 years..... | | 5.0 | 5.3 | 4.7 |
| 25-34 years..... | | 6.3 | 6.7 | 6.0 |
| 35-44 years..... | | 9.4 | 10.4 | 8.3 |
| 45-54 years..... | | 14.5 | 16.1 | 12.9 |
| 55-64 years..... | | 28.4 | 30.9 | 26.0 |
| 65-74 years..... | | 58.3 | 61.6 | 55.1 |
| 75 years and over..... | | 143.0 | 147.4 | 139.2 |

* Exclusive of still-births

† Based on standard million of England and Wales, 1901

Table IV

Principal Causes of Death in the United States Registration Area, 1903-1912

Death Rates per 10,000 of Population

| | 1908 | 1909 | 1910 | 1911 | 1912 | 1903- 1907 | 1908- 1912 |
|--------------------------------------|-------|-------|-------|-------|-------|---------------|---------------|
| Tuberculosis..... | 16.8 | 16.1 | 16.0 | 15.9 | 15.0 | 18.7 | 15.9 |
| Heart Diseases..... | 14.9 | 15.1 | 15.9 | 15.7 | 16.0 | 15.2 | 15.5 |
| Stomach and Intestinal Diseases..... | 15.9 | 15.0 | 16.4 | 13.6 | 12.9 | 16.2 | 14.6 |
| Pneumonia (all forms)..... | 13.1 | 13.8 | 14.8 | 13.4 | 13.2 | 15.5 | 13.6 |
| Nephritis..... | 9.4 | 9.5 | 9.9 | 9.8 | 10.3 | 10.1 | 9.8 |
| Accidents..... | 8.8 | 8.7 | 8.4 | 8.5 | 8.2 | 8.9 | 8.5 |
| Cancer..... | 7.2 | 7.4 | 7.6 | 7.4 | 7.7 | 7.0 | 7.5 |
| Apoplexy..... | 6.9 | 7.2 | 7.4 | 7.5 | 7.6 | 7.1 | 7.3 |
| Liver Diseases..... | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.5 | 2.3 |
| Bronchitis..... | 2.6 | 2.4 | 2.3 | 2.0 | 1.9 | 3.3 | 2.2 |
| Arterial Diseases..... | 1.7 | 2.0 | 2.2 | 2.3 | 2.6 | 1.4 | 2.2 |
| Typhoid Fever..... | 2.4 | 2.1 | 2.4 | 2.1 | 1.7 | 3.1 | 2.1 |
| All Causes..... | 147.8 | 144.0 | 149.6 | 141.6 | 138.7 | 160.3 | 144.1 |

Table V

Deaths in British India, 1901-1910

| ALL CAUSES | | | CHOLERA | | |
|------------|-----------|----------------------------|-----------|-----------|----------------------------|
| Year | Number | Rate per 10,000 Population | Year | Number | Rate per 10,000 Population |
| 1901... | 6,606,387 | 294.6 | 1901.... | 271,210 | 12.1 |
| 1902.... | 7,112,336 | 314.9 | 1902.... | 224,136 | 9.9 |
| 1903.... | 7,881,125 | 347.0 | 1903.... | 312,854 | 13.8 |
| 1904.... | 7,436,472 | 328.6 | 1904.... | 192,835 | 8.5 |
| 1905.... | 8,117,771 | 359.6 | 1905.... | 441,786 | 19.6 |
| 1906.... | 7,852,330 | 347.3 | 1906.... | 690,519 | 30.5 |
| 1907.... | 8,399,623 | 371.8 | 1907.... | 408,102 | 18.1 |
| 1908.... | 8,653,007 | 382.2 | 1908.... | 591,725 | 26.1 |
| 1909.... | 6,998,044 | 309.1 | 1909.... | 239,231 | 10.5 |
| 1910.... | 7,518,034 | 332.0 | 1910.... | 430,451 | 19.0 |
| SMALLPOX | | | PLAGUE | | |
| 1901.... | 89,385 | 4.0 | 1901.... | 237,688 | 10.6 |
| 1902.... | 115,443 | 5.1 | 1902.... | 456,975 | 20.2 |
| 1903.... | 93,693 | 4.1 | 1903.... | 686,485 | 30.3 |
| 1904.... | 55,232 | 2.4 | 1904.... | 940,609 | 41.6 |
| 1905.... | 70,962 | 3.1 | 1905.... | 940,821 | 41.7 |
| 1906.... | 109,583 | 4.8 | 1906.... | 300,355 | 13.3 |
| 1907.... | 103,988 | 4.6 | 1907.... | 1,166,223 | 51.6 |
| 1908.... | 170,694 | 7.5 | 1908.... | 113,888 | 5.0 |
| 1909.... | 101,152 | 4.5 | 1909.... | 145,333 | 6.4 |
| 1910.... | 51,315 | 2.3 | 1910.... | 413,355 | 18.3 |
| FEVERS | | | DYSENTERY | | |
| 1901.... | 4,174,919 | 186.2 | 1901.... | 247,190 | 11.0 |
| 1902.... | 4,279,351 | 189.5 | 1902.... | 235,750 | 10.4 |
| 1903.... | 4,459,237 | 196.6 | 1903.... | 273,459 | 12.1 |
| 1904.... | 4,093,981 | 180.9 | 1904.... | 240,655 | 10.6 |
| 1905.... | 4,417,655 | 195.7 | 1905.... | 264,124 | 11.7 |
| 1906.... | 4,452,842 | 196.9 | 1906.... | 298,117 | 13.2 |
| 1907.... | 4,464,881 | 197.6 | 1907.... | 282,191 | 12.5 |
| 1908.... | 5,424,372 | 239.6 | 1908.... | 285,921 | 12.6 |
| 1909.... | 4,487,492 | 198.2 | 1909.... | 216,956 | 9.6 |
| 1910.... | 4,341,392 | 191.7 | 1910.... | 267,672 | 11.8 |

Table VI

Death Rate of European Troops in India, 1801-1911

| Years | Rate per 1,000 | Years | Rate per 1,000 |
|--------------|----------------|--------------|----------------|
| 1801-30..... | 84.6 | 1891-00..... | 16.2 |
| 1831-56..... | 57.7 | 1901-05..... | 12.2 |
| 1861-65..... | 26.9 | 1906-09..... | 8.7 |
| 1870-79..... | 19.3 | 1910..... | 4.7 |
| 1881-91..... | 14.2 | 1911..... | 4.9 |

LIBRARY OF CONGRESS



0 013 735 030 0

THE PRUDENTIAL INSURANCE COMPANY OF AMERICA

Incorporated as a Stock Company by the State of New Jersey



FORREST F. DRYDEN, *President*

HOME OFFICE, NEWARK, NEW JERSEY



47297